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PATENT SPECIFICATION



Application Date: Sept. 18, 1925. No. 23,326/25.

267,988

Complete Left: May 14, 1926.

Complete Accepted: March 18, 1927.

PROVISIONAL SPECIFICATION.

Improvements in or connected with Artificial Limbs.

We, CHARLES ALBERT BLATCHFORD, CHARLES DUNCAN WILLIAM BLATCHFORD, and WILLIAM ARTHUR DAVID BLATCHFORD, all of 90, Clapham Road, Stockwell, in the County of London, British subjects, do hereby declare the nature of this invention to be as follows:—

This invention relates to improvements in or connected with artificial limbs, and refers more particularly, although not exclusively, to artificial legs.

The object of the invention is to provide an artificial limb or leg which can be carried or supported on the person without the assistance of braces and straps upon the person's body, will obviate friction between the stump of the natural limb and the socket, bucket, or other member into which it fits, and which will become securely fastened upon the natural limb and cannot be accidentally detached therefrom.

In a suitable manner of carrying out the invention the improved artificial limb comprises an india-rubber or other flexible or extensible inner sack, socket, stocking or other member adapted to be placed upon the stump of the natural limb and having, preferably, one or more ribs or projections, grooves or recesses, fitted or formed on its outer and/or inner surface or surfaces. The one or more ribs or projections, grooves or recesses preferably surround, or are disposed within, the sack or other member in the form of one or more helical screw-threads or grooves, and/or by one or more annular projections or grooves joined or communicating with, if so desired, one or more connecting projections, grooves, leads or inlets. The sack or other member is preferably closed at its lower end, and its upper end may be provided with a strengthening ring or band and/or a flange or recess by means of which it can be secured in position.

The sack or other member is preferably used in combination with an outer rigid or flexible bucket or socket, forming part of an artificial limb, and made of metal, wood, papier-mache, india-rubber or other suitable material, and formed, if so desired, with a closed lower end. The lower end of the sack or other member, or of the bucket or socket, is fitted preferably with a spring pressed non-return or other single or double valve. The inner surface of said bucket or socket is preferably formed or fitted with a groove or grooves, or with a protuberance or protuberances, which is or are shaped to form a helical screw-thread or threads and/or one or more annular grooves or projections joined or communicating with, if so desired, one or more connecting grooves, leads or inlets.

With an artificial limb constructed in the manner above described the sack or other member is fitted upon the stump of the natural limb and, if the valve is provided in the lower end thereof, the air located in the same is allowed to escape therefrom thus providing a partial or complete vacuum chamber. The bucket or socket is then fitted over the sack or other member by, when the bucket or socket is formed or fitted with one or more grooves or projections in the manner above described, a screwing, twisting or upward action, air being allowed to escape through the valve therein, when such a member is fitted. Any sinews or other natural parts that remain in the natural stump would thereupon press the sack or other member outwardly and force the projection or projections, groove or grooves into contact with the bucket or socket, or into the groove or grooves, or onto the protuberance or protuberances, when the bucket or socket is so fitted.

By these means we have an artificial

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limb in which the natural stump is gripped in a highly efficient manner without the assistance of shoulder or other straps or braces fitted to the body of the wearer; one in which the stump can contract as time goes on without fear of the artificial limb getting loose or accidentally becoming detached, and whereby the stump is fitted comfortably and easily without rubbing or chafing the same. Of course, if the sack or other member becomes loose in course of time, it is an easy matter to fit a relatively thicker sack or member to the bucket or socket and thus provide a more comfortable fitting for the stump.

It can be realised that, if so desired, the bucket or socket can be formed simply as a belt, band or collar fitted around the stump of the natural limb,

thus doing away with the outer partial or complete vacuum chamber, so long as the inner sack or other member grips the stump with sufficient force and is, preferably, in the form of a partial or complete vacuum chamber in itself. In this case the belt, band or collar would, if so desired, be formed with one or more grooves or protuberances to act in conjunction with the projection or projections, groove or grooves preferably provided on the sack or other member in the manner above described.

Dated this 18th day of September, 1925.

J. S. WITHERS & SPOONER,
Chartered Patent Agents,
Staple House, 51 & 52, Chancery Lane,
London,
Agents for the Applicants.

COMPLETE SPECIFICATION.

Improvements in or connected with Artificial Limbs.

We, CHARLES DUNCAN WILLIAM BLATCHFORD and WILLIAM ARTHUR DAVID BLATCHFORD, both of 90, Clapham Road, London, S.W., and PHILIP EDWARD BROADLEY FOOKS, of 60, Carey Street, London, W.C. 2, all British subjects, legal representatives of CHARLES ALBERT BLATCHFORD, deceased, and CHARLES DUNCAN WILLIAM BLATCHFORD and WILLIAM ARTHUR DAVID BLATCHFORD, both of 90, Clapham Road, Stockwell, in the County of London, British subjects, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in or connected with artificial limbs, and refers more particularly, although not exclusively, to artificial legs.

The object of the invention is to provide an artificial limb or leg which can be carried or supported on the person without the assistance of braces and straps upon the person's body, will obviate friction between the stump of the natural limb and the socket, bucket, or other member into which it fits, and which will become securely fastened upon the natural limb and cannot be accidentally detached therefrom.

According to the present invention the improved artificial limb comprises an india-rubber or other flexible or extensible inner sack, socket, stocking or other member adapted to be placed upon the

stump of a natural limb and having one or more ribs or projections, grooves or recesses fitted or formed on its outer surface or its outer and inner surfaces, and an outer rigid or flexible bucket, socket, belt, band or collar also provided with one or more ribs or projections, grooves, recesses, protuberances or the like adapted to receive the one or more ribs, or projections, grooves or recesses fitted or formed on the inner sack or member.

The invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is an elevational view, partly in section, of a portion of the right-hand artificial leg and showing the invention applied thereto, and

Figure 2 is an elevation partly in section, with the lower parts broken away and showing a suitable modification.

Thus, in a suitable manner of carrying out the invention, and as shown in the accompanying drawings, the improved artificial limb comprises an india-rubber or other flexible or extensible inner sack, socket, stocking or other member *a* adapted to be placed upon the stump of the natural limb and having one or more ribs or projections *b*, grooves or recesses, fitted or formed on its outer surface *c* or its outer and inner surfaces. The one or more ribs or projections *b*, grooves or recesses preferably surround, or are also disposed within, the sack or other member *a* in the form of one or more helical screw-threads *d* or grooves, and/or by

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one or more annular projections or grooves joined or communicating with, if so desired, one or more connecting projections, grooves, leads or inlets. The sack or other member *a* is preferably closed at its lower end at *e* and its upper end may be provided with a strengthening ring or band *f* and/or a flange or recess by means of which it can be secured in position.

The sack or other member *a* is used in combination with an outer rigid or flexible bucket or socket *g*, Figure 1, forming part of an artificial limb, such as *h*, and made of metal as shown, or of wood, papier-mache, india-rubber or other suitable material, and formed, if so desired, with a closed lower end as at *i*. The lower end *e* of the sack or other member *a*, or of the bucket or socket *g* as shown in this instance, is fitted, preferably, with a spring pressed non-return valve *j* or with another form of single or double valve. The inner surface, or the inner and outer surfaces *k* and *l*, of said bucket or socket *g* is formed or fitted with a groove or grooves, or with a protuberance or protuberances, or with a helical screw-thread or threads *m* and/or one or more annular grooves or projections joined or communicating with, if so desired, one or more connecting grooves, leads or inlets.

With an artificial limb constructed in the manner above described the sack or other member *a* is fitted upon the stump of the natural limb, and, if the valve is provided in the lower end thereof, the air located in the same is allowed to escape therefrom thus providing a partial or complete vacuum chamber. The bucket or socket *g* is then fitted over the sack or other member *a* by, when the bucket or socket is formed or fitted with one or more screw-threads *m*, grooves or projections in the manner above described, a screwing, twisting or upward action, air being allowed to escape through the valve *j* therein, when such a member is fitted. Any sinews or other natural parts that remain in the natural stump would thereupon press the sack or other member *a* outwardly and force the projection or projections *b*, groove or grooves into contact with the bucket or socket *g*, or into the groove or grooves *m* in the interior surface, or onto the protuberance or protuberances, when the bucket or socket is so fitted.

By these means we have an artificial limb in which the natural stump is gripped in a highly efficient manner without the assistance of shoulder or other straps or braces fitted to the body of the wearer, one in which the stump

can contract as time goes on without fear of the artificial limb getting loose or accidentally becoming detached, and whereby the stump is fitted comfortably and easily without rubbing or chafing the same. Of course, if the sack or other member *a* becomes loose in course of time, it is an easy matter to fit a relatively thicker sack or member to the bucket or socket and thus provide a more comfortable fitting for the stump.

It can be realised that, if so desired, and as illustrated in Figure 2, the bucket or socket can be formed simply as a belt, band or collar *n* fitted around the stump of the natural limb, thus doing away with the outer partial or complete vacuum chamber as shown in Figure 1, so long as the inner sack or other member *a* grips the stump with sufficient force and is, preferably, in the form of a partial or complete vacuum chamber in itself and is fitted, suitably, with a valve *j*¹. In this case the belt, band or collar *n* would be formed with one or more grooves *m*¹ or protuberances to act in conjunction with the projection or projections *b*¹, groove or grooves provided on the sack or other member *a*¹ in the manner above described.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An artificial limb, comprising an india-rubber or other flexible or extensible inner sack, socket, stocking or other member adapted to be placed upon the stump of a natural limb and having one or more ribs or projections, grooves or recesses fitted or formed on its outer surface or its outer and inner surfaces, and an outer rigid or flexible bucket, socket, belt, band or collar also provided with one or more ribs or projections, grooves, recesses, protuberances or the like adapted to receive the one or more ribs, or projections, grooves or recesses fitted or formed on the inner sack or member.

2. An artificial limb, as claimed above, in which the inner sack or other member is formed or provided with one or more helical screw-threads or grooves and/or with one or more annular projections or grooves joined or communicating with, if so desired, one or more connecting projections, grooves, leads or inlets, whilst the outer bucket, belt or the like is fitted with one or more helical screw-threads and/or one or more annular grooves or projections joined or communicating with, if thought suitable, one or more connecting grooves, leads or inlets.

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3. An artificial limb according to Claim 1, in which the sack or other member, and/or the outer bucket or socket, is or are closed at its or their lower end or ends. 5
4. An artificial limb constructed according to the preceding claim, in which the closed lower end of the sack or other member, or of the bucket or socket, is fitted with a spring pressed non-return or other single or double valve, for the purposes described. 10
5. An artificial limb, as claimed in Claim 1, in which the sack or other member is fitted upon the stump of the natural limb and the bucket, belt or the like is then fitted over said sack or other member by a screwing, twisting or upward action, the sinews or other natural parts that remain in the natural stump thereupon pressing the sack or other member outwardly and forcing the projections or grooves thereon into contact with the socket, belt or the like, into the grooves, or on to the protuberances thereupon, thus holding the artificial limb in position. 25
6. The improved artificial limbs constructed substantially as described with reference to the accompanying drawings. 30

Dated this 14th day of May, 1926.

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Agents for the Applicants. 35

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1927.

[This Drawing is a reproduction of the Original on a reduced scale.]

FIG. 1.

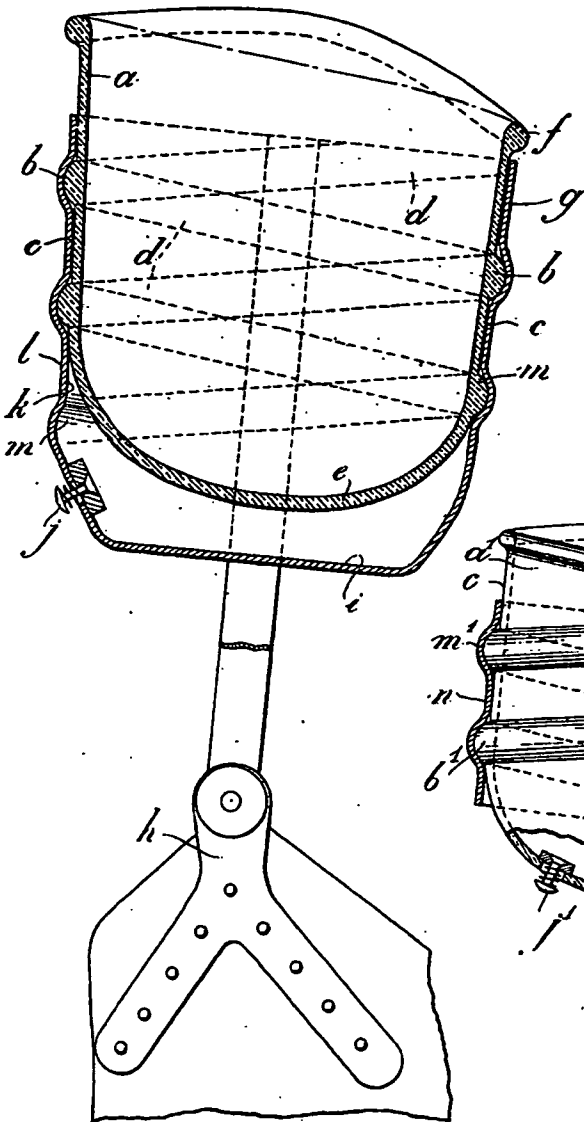
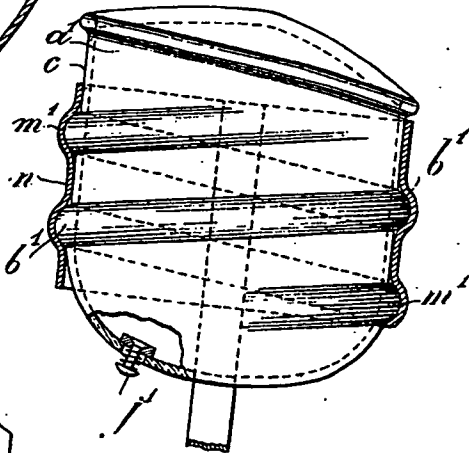


FIG. 2.



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